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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,461	07/07/2003	Zhixin Li	ferus0603	7582

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EXAMINER

PICKARD, ALISON K

ART UNIT	PAPER NUMBER
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3676

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,461

Applicant(s)

LI, ZHIXIN

Examiner

Alison K. Pickard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1-14-05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Black (5,560,620) in view of European Patent 182,656 A2 (EP '656).

Black discloses a magnetic assembly and a method of making a multistage magnetic rotary seal comprising a shaft 10 having plural ridges 11, an annular magnet 40, a first pole piece 20, and a second pole piece 20. Each of the pole pieces 20 has plural ridges 22 along an inner diameter that are spatially opposed to the ridges on the shaft (e.g. see Figure 6a). The ridges are in close, non-contacting relationship to define a radial gap 26 for ferrofluid disposed there between. The ridges form plural stages. Black discloses that the ridges 11 and 22 can be of any shape (see col. 10, lines 20-23). However, Black does not appear to disclose a trapezoidal shape having tapered sides diverging (at an angle between 0 to 180 degrees) from a top plateau to an annular region. EP '656 discloses a magnetic assembly having a shaft, magnet, and two pole pieces. EP '656 teaches art equivalent shapes for ridges forming stages. Figure 8 teaches a trapezoidal shape having tapered, diverging sides 62 from a plateau portion 64. The sides diverge at an angle between the required range. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the shape of the ridges to a

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trapezoidal shape as such is an art equivalent shape (i.e. to a rectangular shape) as taught by EP '656.

Response to Arguments

3. Applicant's arguments filed 1-14-05 have been fully considered but they are not persuasive.

Applicant argues that there is no motivation to combine Black with EP '656 because Applicant argues that EP '656 implies that the tapered structure is inferior to the standard structure and because EP '656 does not provide a higher pressure capacity as a benefit. The examiner disagrees. First, while EP' 656 states that the seals of the invention are useful where pressure capacity is not a critical factor, EP '656 does not limit the use to such an environment. EP '656 only states that it is "particularly useful" in such an environment. The disclosure also lists several other environments, which are similar to those Black is concerned with. Second, EP '656 does NOT imply that the tapered seal is inferior to the standard. In fact, EP '656 specifically states that the invention provides an improved ferrofluid seal (see page 5, lines 2-6 and page 6, lines 5-8). EP '656 also specifically states that the seal "achieves maximum pressure capacity" in addition to its many other benefits (page 6, lines 17-24 and see page 4 lines 10-15). Finally, EP '656 does not distinguish the trapezoidal shape from the other shapes (see Figs 7-9), thus all are art equivalents and would offer the same benefits as set forth above. Clearly, one of ordinary skill in the art would have the knowledge and motivation to combine Black and EP '656.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 703-305-0882. The examiner can normally be reached on M-F (10-7:30), with alternate Friday's off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on 703-308-2978. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alison K. Pickard
Primary Examiner
Art Unit 3676

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